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shown that the macerated vegetable fragments in the pebbles of Grand Croix exhibited the same progressive demolition of cell wall which is observed in modern cases. Van Tieghem even believes he has seen his Bacillus Amylobacter in a silicified state."—ERWIN F. SMITH.

VIALA, PIERRE. *Monographie du Pourridie des Vignes et des Arbres fruitiers.* Montpellier, 1891, pp. 121, pl. 7.

This monograph constitutes a thesis presented to the Paris Faculty of Sciences by Mons. Pierre Viala for a doctor's degree. It comprises the results of eight years work, and shows important additions to the status of the subject as recorded in the article on Pourridie in "*Maladies de la Vigne.*"

The thesis is divided into three parts. The first is historical, and treats briefly the relation of *Agaricus melleus*, *Vibrissea hypogœa*, *Fibrillaria* and *Dematophora* to Pourridie. The second part is confined to the last of these, which the author considers the principle cause of Pourridie. *Dematophora necatrix* is a species chosen for investigation, because, with the exception of a few sandy places, this is the only species of Dematophora found on vines attacked by Pourridie.

The parasitic and saprophytic nature of the fungus is fully discussed. The former has been fully proven by experiments, but is exhibited only by certain forms of the mycelium, the fruit being never produced until the host is killed.

Five forms of mycelium are distinguished—a white flocculent mycelium, a brown mycelium, root-like cords, *Rhizomorpha fragilis*, var. *subterranea*, *Rhizomorpha fragilis*, var. *subcorticalis*, and an internal mycelium. The Rhizomorpha forms agree externally with those bearing the same name, but belonging to *Agaricus melleus*, but the specific differences are carefully pointed out.

The fruiting forms are as numerous as those of the mycelium; they are chlamydospores, sclerotia, conidia, pycnidia, and perithecia. The two latter forms are here described for the first time, and, judging from what is known of other fungi, they complete the life history of the parasite. The development of these hitherto unknown forms was obtained by a special variation of the conditions under which the artificial cultures were made. Under the most favorable circumstances the pycnidia require from one year to a year and a half from the sowing of the spores to arrive at maturity; and the perithecia two years and a half.

The author has made many valuable experiments to ascertain the vitality of the fungus, the proper conditions for its development, and its resistance to fungicides. These are of especial economic importance. Much space is given to a detailed morphological description of all the forms of the fungus, especially of the mycelium.

A description of *Dematophora glomerata* is also included in the second part of the thesis. The mycelium, sclerotia, pycnidia, and conidiophores are described. The third part includes descriptions of the following forms which are often confused with Pourridie. *Fibrillaria*

(*Psathyrella*) *ampelina*, *Speira densa*, n. sp., *S. dematophoræ*, n. sp., and *Cryptocoryneum aureum*, n. sp.—EFFIE A. SOUTHWORTH.

WARD, H. MARSHALL. *Croonian Lecture: On some Relations between Host and Parasite in certain Epidemic Diseases of Plants.* Read February 27, 1890. Proc. Royal Society, London, vol. 47, No. 290, pp. 393-443, figs. 15.*

The study of plant diseases has shown rapid progress during the past decade and disciples of this branch of botany have reason to hope for still greater progress in the near future. Few, however, would have supposed that a work of the scope and value of the one before us would be possible at the present day. Prof. Ward has long been justly famed both for his successes in original investigations and for his happy faculty in expressing his results in the most lucid English. In the present lecture the author treats one of the most difficult, and at the same time one of the most important, subjects in the range of vegetable pathology. The introduction deals with the general subject of the relations existing between host and parasite. The author shows the close connection of normal life processes (physiological) and the abnormal ones (pathological), and insists that students in each branch must know what those in the other are doing. Then the behavior of the normal tissues is taken up and the fundamental processes going on in living cells are sketched.

The next section is concerned with the death of the cell, the author concluding with the following paragraph:

> Between the normal life, *i. e.*, the condition of affairs where the life processes are going on actively, and the state of permanent death, then, there are all possible gradations; many of these gradations coincide with the phenomena of disease—pathological conditions—and it is toward this difficult domain that I have now to carry the discussion.

Then the variations in environment as effecting the physiological processes in the host are considered, and the consequences of variations in temperature, in intensity of light, in the amount of aqeuous vapor in the atmosphere, etc., are shown. What is of special interest to workers in plant diseases is that the effects of these variations as predisposing causes to certain diseases are explained. The case is considered of a herbaceous plant growing in midsummer, which has previously been well supplied with heat and light. Then suddenly cold, dark, rainy weather sets in, and as a net result the parenchymatous tissues are particularly tender and watery, the cell walls thin and soft, the protoplasm more permeable and less resistant; the cell sap contains a larger amount than usual of organic acids, glucose, and soluble nitrogenous materials.

After rapidly sketching the state of our knowledge of the species of *Botrytis* which may under some circumstances cause widespread epidemics

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*The number containing the article can be obtained from Harrison & Sons, 45-46 St. Martin's Lane, London, W. C., England, for 1 shilling 6 pence.